**Claims**

What is claimed is:

1. A method for locating the position of a blood vessel in a subject by receiving and analyzing Doppler shifted reflections of ultrasonic energy of wave lengths $\lambda$ transmitted into the subject by a 1½ D probe terminated by an array of transducer elements, the array comprising a plurality of rows, the element having center to center spacing on the order of $\lambda$ or less along the rows and forming columns with center to center spacing of several times $\lambda$ perpendicular to the rows, the method comprising:

a) transmitting pulses of ultrasonic energy into the subject;

b) receiving Doppler shifted reflections from the blood vessel;

c) analytically forming a limited number of simultaneously formed receive beams at each column position;

d) steering the receive beams in a first direction along the rows to accurately determine the row direction position of the blood vessel;

e) determining the blood vessel's position in a second direction along the columns at each column position by comparison of Doppler power detected by the limited number of receive beams; and

f) determining the blood vessels position in a direction perpendicular to both the rows and columns by time delay data.

2. A method of Claim 1 comprising modestly steering the simultaneously formed receive beams in the second direction and determining a steering degree at each column position at which the Doppler power received by each beam is the same, the degree of steering

producing zero power difference at each column position, thus determining the blood vessel's position in the second direction at each column position.

3. A method of Claim 2 comprising determining a difference between the Doppler power received by each beam and driving the difference to zero by a monopulse technique.

4. A method of Claim 1 in which the probe has three rows and the received ultrasound energy is analyzed to form a pair of simultaneously formed receive beams.

5. A method of Claim 1 comprising transmitting the blood vessel's position to a user interface.

6. A method of Claim 5 comprising displaying the blood vessel's position.

7. A method of Claim 5 comprising storing the blood vessel's position.

8. A method of Claim 1 comprising resolving the blood vessel's position from a closely spaced second blood vessel's position by comparing Doppler shift data from the blood vessel with Doppler shift data from the second blood vessel.

9. A device for locating the position of a blood vessel in a subject by receiving and analyzing Doppler shifted reflections of ultrasonic energy of wave lengths $\lambda$ transmitted into the subject by a 1½ D probe terminated by an array of transducer elements, the array comprising a plurality of rows, the element having center to center spacing on the order of $\lambda$ or less along the rows and forming columns with center to center spacing of several times $\lambda$ perpendicular to the rows, the device comprising:

a) an ultrasound pulse transmitter for energizing the 1½ D probe to transmit pulses of ultrasound energy;

b) an analog processor for receiving ultrasound signals, from the probe reflected by the subject and detected by the probe and producing a digital data stream;

c) a digital processor under software control for analyzing the digital data stream to determine the blood vessel's position by analytically steering receive beams in the row direction at each column position to determine the row-direction position of the blood vessel, analyzing time delay information in the digital data stream to determine the range of the blood vessel, and analytically forming a limited number of simultaneously formed receive beams at each column position for determining the blood vessels position in the column direction by comparing Doppler power detected by the limited number of receive beams, the digital processor producing analyzed data;

d) an output module for processing the analyzed data and producing output signals for display or storage.

10. A device of Claim 9 in which the digital processor is adapted for modestly steering the simultaneously formed receive beams in the second direction and determining a steering degree at each column position at which the Doppler power received each beam is the same, the degree of steering producing zero power difference at each column position determining the blood vessel's position in the column direction at each column position.

11. A device of Claim 10 in which the digital processor is adapted for determining a difference between the Doppler power received by each beam and driving the difference to zero by a monopulse technique.

12. A device of Claim 9 comprising the 1½ D probe.

13. A device of Claim 9 in which the 1½ D probe has three rows and the digital processor is adapted to produce a pair of simultaneously formed receive beams.